



Size: 3.78in x 2.13in x 0.92in (96mm x 54mm x 23.3mm)

**FEATURES**

- Ultra-Wide 4:1 Input Voltage Range
- Fully Regulated Output Voltage
- Fully Encapsulated Plastic Case for Chassis & DIN-Rail Mounting Version
- High Efficiency to 91%
- I/O Isolation of 2500VDC
- Over Load, Over Voltage, and Short Circuit Protection
- Remote On/Off Control
- RoHS & REACH Compliant
- UL/cUL/IEC/EN 60950-1 Safety Approval & CE Marking

**DESCRIPTION**

The DCWIM20 series of DC/DC power modules offers 20 watts of output power in a fully encapsulated 3.78" x 2.13" x 0.92" plastic case with chassis or DIN-Rail mounting. This series consists of fully regulated single output models with an ultra-wide 4:1 input voltage range and high efficiency to 91%. Each model has RoHS & REACH compliance, remote On/Off control, and over load, over voltage, and short circuit protection. This series also has UL/cUL/IEC/EN 60950-1 safety approvals and CE markings. Please contact factory for order details.

**MODEL SELECTION TABLE**

Model Number <sup>(1)</sup>	Input Voltage Range	Output Voltage	Output Current	Input Current		Maximum Capacitive Load	Efficiency	Ripple & Noise	Output Power
				No Load	Max. Load				
DCWIM20-24S51C	24VDC (9~36VDC)	5.1VDC	4000mA	70mA	944mA	6800µF	90%	100mVp-p	20W
DCWIM20-24S12C		12VDC	1670mA		918mA	1160µF	91%	150mVp-p	
DCWIM20-24S24C		24VDC	835mA		918mA	300µF	91%	150mVp-p	
DCWIM20-24S48C		48VDC	420mA		944mA	75µF	89%	200mVp-p	
DCWIM20-48S51C	48VDC (18~75VDC)	5.1VDC	4000mA	35mA	472mA	6800µF	90%	100mVp-p	20W
DCWIM20-48S12C		12VDC	1670mA		459mA	1160µF	91%	150mVp-p	
DCWIM20-48S24C		24VDC	835mA		459mA	300µF	91%	150mVp-p	
DCWIM20-48S48C		48VDC	420mA		472mA	75µF	89%	200mVp-p	

**SPECIFICATIONS**

All specifications are based on 25°C, Resistive Load, Nominal Input Voltage, and Rated Output Current unless otherwise noted. We reserve the right to change specifications based on technological advances.

SPECIFICATION	TEST CONDITIONS	Min	Typ	Max	Unit
Input Voltage Range	24V Input Models	9		36	VDC
	48V Input Models	18		75	
Start-Up Threshold Voltage	24V Input Models			9	VDC
	48V Input Models			18	
Under Voltage Shutdown	24V Input Models		7.5		VDC
	48V Input Models		16		
Input Surge Voltage (100ms Max.)	24V Input Models	-0.7		50	VDC
	48V Input Models	-0.7		100	
Input Filter	All Models	Internal Pi Type			
<b>OUTPUT SPECIFICATIONS</b>					
Output Voltage		See Table			
Voltage Accuracy			±2.0		%Vnom
Line Regulation	Vin=Min. to Max. @Full Load		±0.5		%
Load Regulation	Io=0% to 100%		±0.5		%
Output Power		See Table			
Output Current		See Table			
Minimum Load		No Minimum Load Requirement			
Maximum Capacitive Load		See Table			
Ripple & Noise	20MHz bandwidth	See Table			
Transient Recovery Time <sup>(2)</sup>	25% Load Step Change		250		µSec
Transient Response Deviation	25% Load Step Change		±3	±5	%
Start-Up Time	Power Up	Nominal Vin and Constant Resistive Load		30	ms
	Remote On/Off			30	
Temperature Coefficient			±0.02		%/°C

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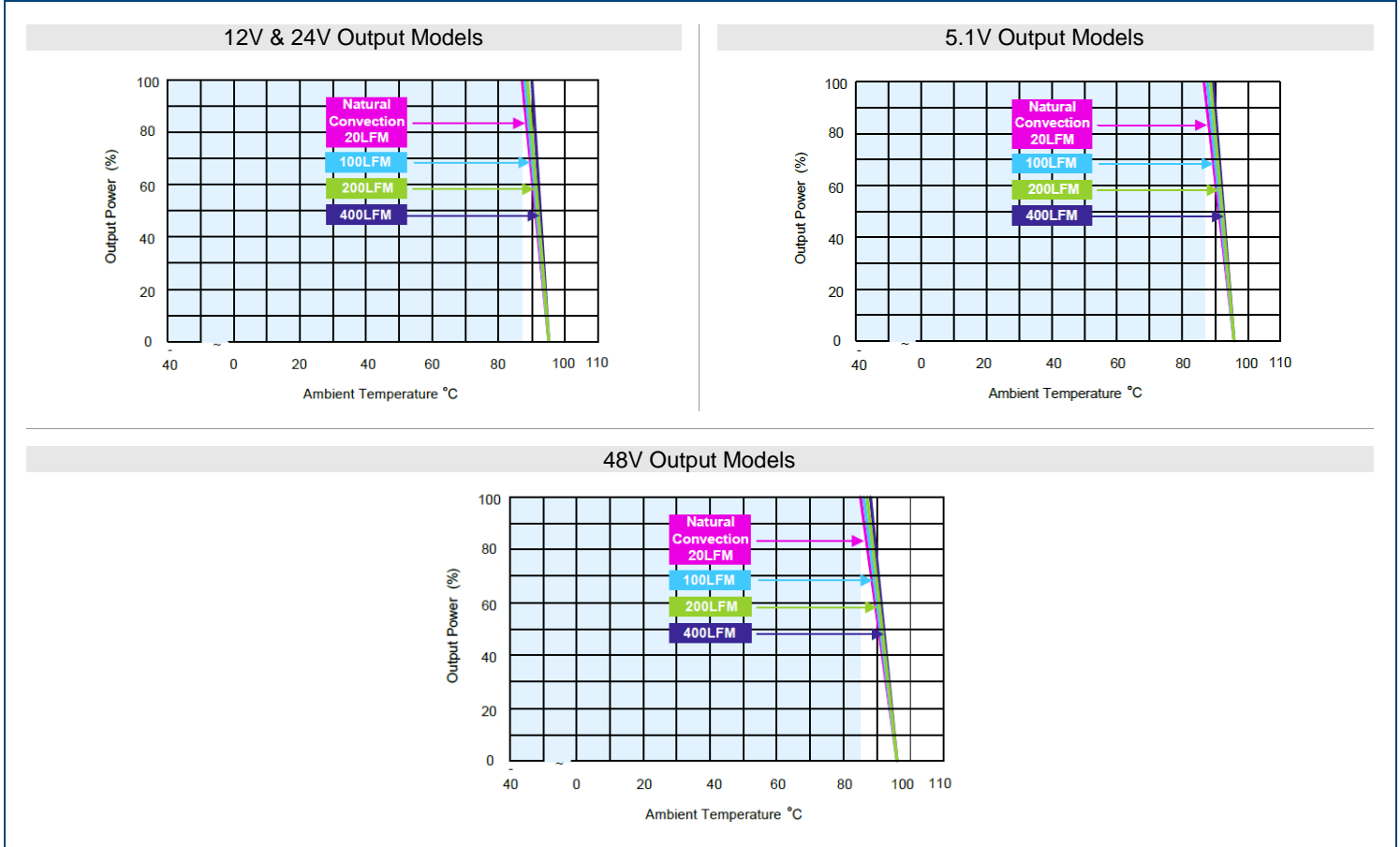
SPECIFICATION	TEST CONDITIONS	Min	Typ	Max	Unit
<b>REMOTE ON/OFF CONTROL</b>					
Converter On		3.5V~12V or Open Circuit			
Converter Off		0V~1.2V or Short Circuit			
Control Input Current (On)	Vctrl=5.0V			0.5	mA
Control Input Current (Off)	Vctrl=0V			-0.5	mA
Control Common		Referenced to Negative Input			
Standby Input Current	Supply Off & Nominal Vin		3		mA
<b>PROTECTION</b>					
Short Circuit Protection	Hiccup Mode 0.25Hz typ.	Automatic Recovery			
Over Load Protection	Hiccup		150		%
Over Voltage Protection	Zener Diode Clamp		120		% of Vo
<b>ENVIRONMENTAL SPECIFICATIONS</b>					
Operating Ambient Temperature	Natural Convection, Nominal Vin, Load 100% Inom.	12V & 24V Output Models	-40	+87	°C
		5.1V Output Models	-40	+86	
		48V Output Models	-40	+85	
Storage Temperature			-50	+125	°C
Thermal Impedance	Natural Convection		3.9		°C/W
	100LFM Convection		3.3		
	200LFM Convection		3.1		
	400LFM Convection		2.5		
Humidity	Non-Condensing			95	%RH
Case Temperature				+95	°C
Cooling <sup>(3)</sup>		Natural Convection			
MTBF (Calculated)	MIL-HDBK-217F @25°C, Ground Benign		775,200		Hours
<b>GENERAL SPECIFICATIONS</b>					
Efficiency	@Max Load	See Table			
Switching Frequency			285		KHz
I/O Isolation Voltage	60 Seconds	2500			VDC
Isolation Resistance	500VDC	1000			MΩ
Isolation Capacitance	100KHz, 1V			2200	pF
<b>PHYSICAL SPECIFICATIONS</b>					
Weight	Chassis Mount	3.77oz (107g)			
	DIN Rail Mount	5.86oz (166g)			
Dimensions (L x W x H)		3.78in x 2.13in x 0.92in (96mm x 54mm x 23.3mm)			
Case Material		Plastic Resin (Flammability to UL 94V-0)			
<b>SAFETY CHARACTERISTICS</b>					
Safety Approvals	UL/cUL 60950-1 Recognition (UL Certificate) IEC/EN 60950-1 (CB Report)				
EMI	EMI Conducted Class A with no external components	EN55022, FCC Part 15			Class A
	EMI Radiated Class A External Components				
EMS	EN55024				
	ESD	EN61000-4-2 Air ±8kV, Contact ±4kV			A
	Radiated Immunity	EN61000-4-3 10V/m			A
	Fast Transient	EN61000-4-4 ±2kV			A
	Surge	EN61000-4-5 ±2kV			A
	Conducted Immunity	EN61000-4-6 10Vrms			A
	PFMF	EN61000-4-8 30A/M			A

**NOTES**

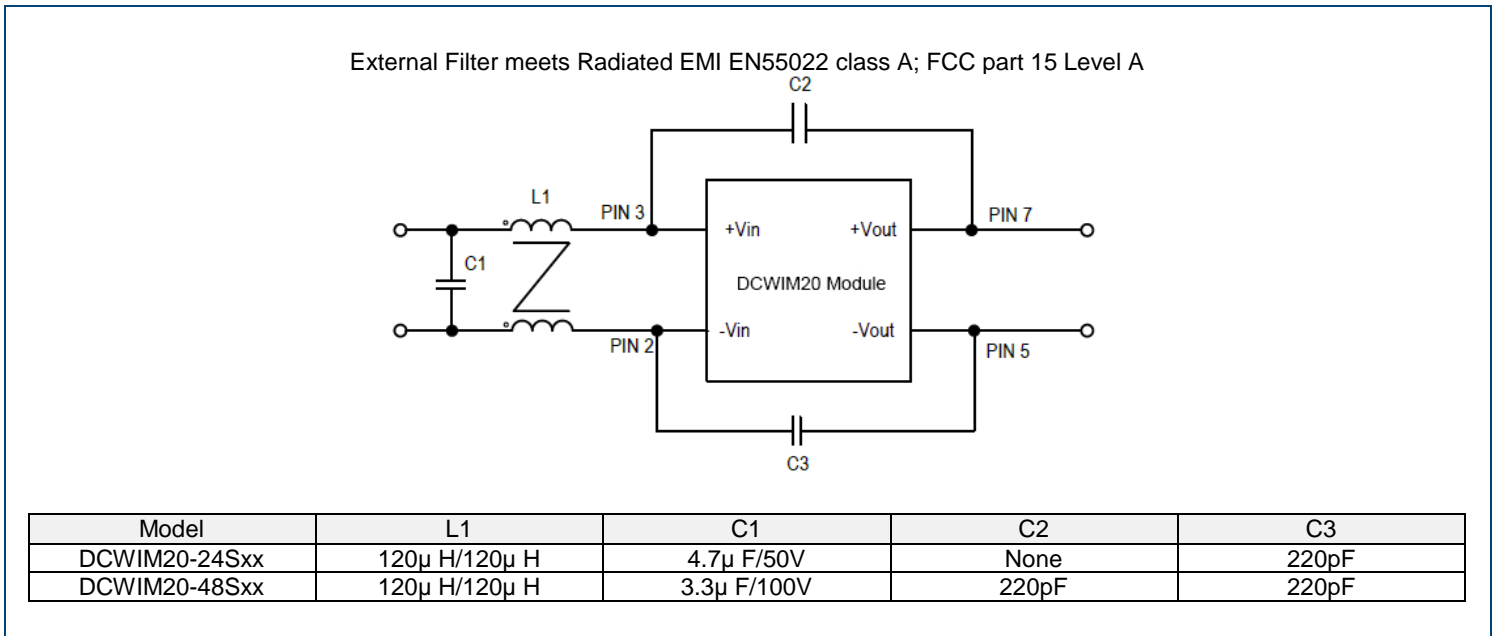
1. Din Rail Mounting is available for this series. To indicate Din Rail bracket add -D to model number. Ex. DCWIM20-24S51C-D
2. Transient recovery time is measured to within 1% error band for a step change in output load of 75% to 100%.
3. Natural Convection is about 20LFM but is not equal to still air (0 LFM).
4. It is recommended to protect the converter by a slow blow fuse in the input supply line.
5. Other input and output voltages may be available, please contact factory.

\*Due to advances in technology, specifications subject to change without notice.

**DERATING CURVES**

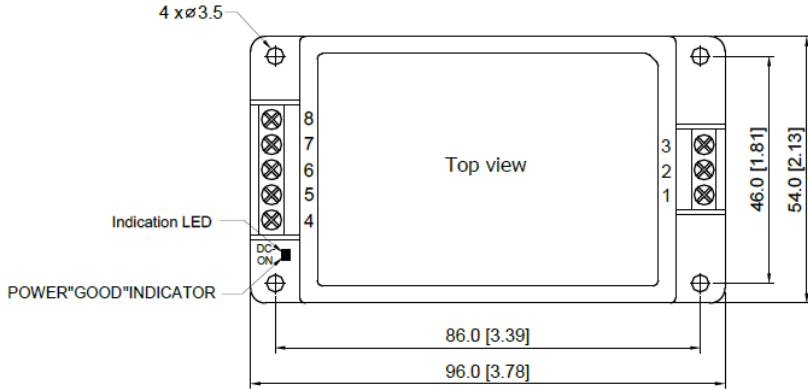


**EXTERNAL FILTER**



MECHANICAL DRAWINGS

Chassis Mounting



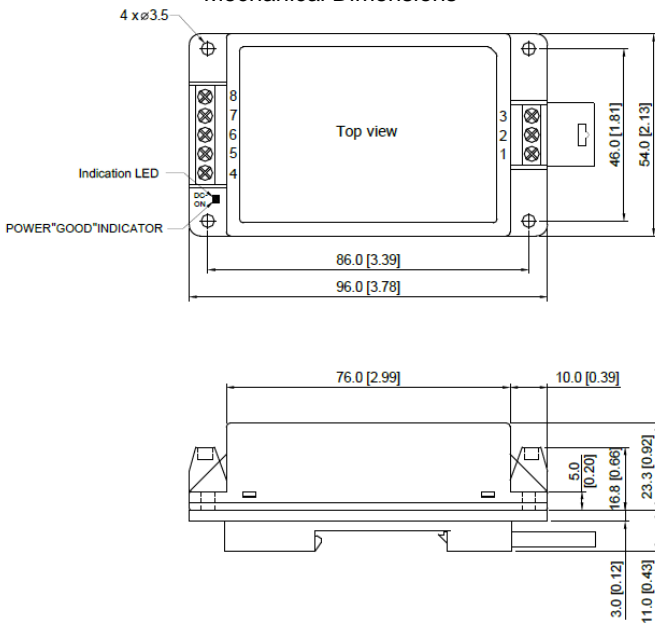
Connections	
Pin	Function
1	Remote On/Off
2	-Vin
3	+Vin
4	NC
5	-Vout
6	NC
7	-Vout
8	NC

NC: No Connection

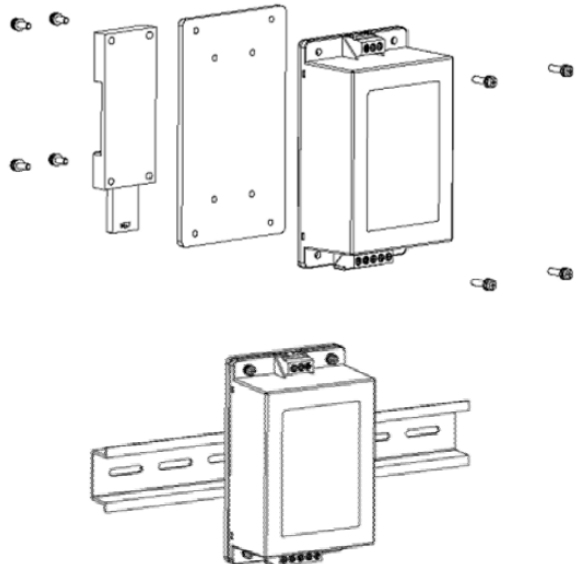
Notes:  
 All dimensions in mm (inches)  
 Tolerance: ±0.5 (±0.02)

DIN Rail Mounting Bracket (-D Suffix)

Mechanical Dimensions



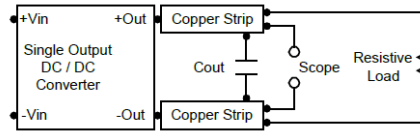
DIN-Rail Mounting Kit



**TEST SETUP**

**Peak-to-Peak Output Noise Measurement Test**

Scope measurement should be made by using a BNC socket, measurement bandwidth is 0-20MHz. Position the load between 50mm and 75mm from the DC/DC Converter.



**TECHNICAL NOTES**

**Remote On/Off**

Positive logic remote on/off turns the module on during a logic high voltage on the remote on/off pin, and off during a logic low. To turn the power module on and off, the user must supply a switch to control the voltage between the on/off terminal and the -Vin terminal. The switch can be an open collector or equivalent. A logic low is 0V to 1.2V. A logic high is 3.5V to 12V. The maximum sink current at the on/off terminal (Pin 1) during a logic low is -100µA.

**Overload Protection**

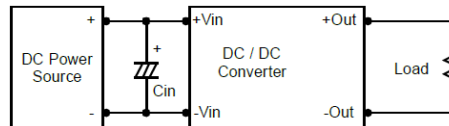
To provide hiccup mode protection in a fault (output overload) condition, the unit is equipped with internal current limiting circuitry and can endure overload for an unlimited duration.

**Overvoltage Protection**

The output overvoltage clamp consists of control circuitry, which is independent of the primary regulation loop that monitors the voltage on the output terminals. The control loop of the clamp has a higher voltage set point than the primary loop. This provides a redundant voltage control that reduces the risk of output overvoltage. OVP can be found in data sheet.

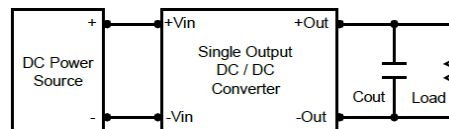
**Input Source Impedance**

The power module should be connected to a low ac-impedance input source. Highly inductive source impedances can affect the stability of the power module. In applications where power is supplied over long lines and output loading is high, it may be necessary to use a capacitor at the input to ensure startup. Capacitor mounted close to the power module helps ensure stability of the unit, it is recommended to use a good quality low Equivalent Series Resistor (ESR <math>< 1.0\Omega</math> at 100KHz) capacitor of a 10µF for the 24V and 48V devices.



**Output Ripple Reduction**

A good quality low ESR capacitor placed as close as practicable across the load will give the best ripple and noise performance. To reduce output ripple it is recommended to use 4.7µF capacitors at the output.



**Maximum Capacitive Load**

The DCWIM20 series has limitation of maximum connected capacitance at the output. The power module may be operated in current limiting mode during start-up, affecting the ramp-up and the startup time. The maximum capacitance can be found in datasheet.

**Thermal Considerations**

Many conditions affect the thermal performance of the power module, such as orientation, airflow over the module, and board spacing. To avoid exceeding the maximum temperature rating of the components inside the power module, the case temperature must be kept below 95°C. The derating curves are determined from measurements obtained in a test setup.



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COMPANY INFORMATION

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Our past projects demonstrate our commitment to you, our customer. Wall Industries, Inc. has a reputation for working closely with its customers to ensure each solution meets or exceeds form, fit and function requirements. We will continue to provide ongoing support for your project above and beyond the design and production phases. Give us a call today to discuss your future projects.

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